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## FUNCTIONALIZATION AND IMMOBILIZATION OF WHOLE CELL BIOREPORTERS FOR THE DETECTION OF ENVIRONMENTAL CONTAMINATION

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### Abstract

The detection of environmental pollutants has challenged conventional chemical analysis for the rapid estimation of the bioavailability and toxicity of the contamination impact on human health and ecosystems. Magnetic nanoparticles (MNPs) functionalization as bioreporters can enhance the ability for biosensing in complex contaminated samples such as soils, and the immobilization of bioreporters will promote the detection of gas and online monitoring. In this study, *Acinetobacter baylyi* ADP1 bioreporters ADPWH\_lux and ADPWH\_recA were used to evaluate the optimization of MNPs bioreporter functionalization and filter immobilization. It demonstrated that the MNPs functionalized and filter-immobilized bioreporters retained a similar sensitivity to the original non-treated bioreporters. These approaches will provide new ways for the detection of contaminants in soil and air samples, with prospects for *in situ* and online measurement. This study also suggested that portable application and miniaturization is possible when the functionalized bioreporter is immobilized on a filter or magnetic probe.

*Key words:* *Acinetobacter baylyi* ADP1, bioreporter, filter immobilization, genotoxicity, magnetic nanoparticles

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